

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1-13 (canceled).

14. (new): A correcting device to compensate for perturbations of the polarization distribution over the cross section of a light beam in an optical system, comprising a correcting member which comprises:

- a first birefringent correcting element having two substantially parallel first surfaces and a substantially constant first thickness in a direction perpendicular to the first surfaces,
- a second birefringent correcting element having two substantially parallel second surfaces and a substantially constant second thickness in a direction perpendicular to the second surfaces,

wherein at least one of the first and second surfaces is reprocessed so as to create local thickness variations Δd by which the perturbations of the polarization distribution are compensated at least approximately, and

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wherein the arrangement, the first and second thicknesses and birefringence properties of the first and second correcting element are selected so that their birefringent effects cancel each other out when the local thickness variations Δd are neglected.

15. (new): The correcting device of Claim 14, wherein the correcting elements consist essentially of a same material.

16. (new): The correcting device of Claim 15, wherein the first and second surfaces are reprocessed complementarily with one another so that the total thickness of all correcting elements of the correcting member is constant over the cross section.

17. (new): The correcting device of Claim 16, wherein the local thickness variation Δd required for the perturbation compensation at a particular point is distributed among the first and the second correcting element so that the thickness of the first correcting element is reduced by $\Delta d/2$ at the particular point and the thickness of the second correcting element is increased by $\Delta d/2$.

18. (new): The correcting device of Claim 14, wherein the first and second surfaces are curved.

19. (new): The correcting device of claim 14, wherein the first and second correcting element have birefringence axes that are mutually rotated by 90° .

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20. (new): The correcting device of claim 14, wherein at least one correcting element has a surface which is additionally reprocessed so as to reduce wavefront errors due to the thickness variations.

21. (new): The correcting device of Claim 14, further comprising a second correcting member, wherein the correcting elements of the one correcting member have birefringence axes that are rotated by 45° relative to birefringence axes of the correcting elements of the second correcting member.

22. (new): A projection objective for a microlithographic exposure apparatus, comprising the correcting device of Claim 14.

23. (new): The projection objective of Claim 22, wherein the correcting device is arranged at least approximately in a pupil plane of the projection objective.

24. (new): The projection objective of Claim 23, wherein the correcting device is arranged in immediate vicinity of an imaging mirror, which is contained in a catadioptric part of the projection objective.

25. (new): The projection objective of Claim 23, comprising a further correcting device which is arranged at least approximately in a field plane of the projection objective,

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wherein the correcting device comprises a correcting member that includes:

- a first birefringent correcting element having two substantially parallel first surfaces and a substantially constant first thickness in a direction perpendicular to the first surfaces,
- a second birefringent correcting element having two substantially parallel second surfaces and a substantially constant second thickness in a direction perpendicular to the second surfaces,

wherein at least one of the first and second surfaces is reprocessed so as to create local thickness variations Δd by which the perturbations of the polarization distribution are compensated at least approximately, and

wherein the arrangement, the first and second thicknesses and birefringence properties of the first and second correcting element are selected so that their birefringent effects cancel each other out when the local thickness variations Δd are neglected.

26. (new): The projection objective of Claim 24, comprising a further correcting device which is arranged at least approximately in a field plane of the projection objective,

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wherein the correcting device comprises a correcting member that includes:

- a first birefringent correcting element having two substantially parallel first surfaces and a substantially constant first thickness in a direction perpendicular to the first surfaces,
- a second birefringent correcting element having two substantially parallel second surfaces and a substantially constant second thickness in a direction perpendicular to the second surfaces,

wherein at least one of the first and second surfaces is reprocessed so as to create local thickness variations Δd by which the perturbations of the polarization distribution are compensated at least approximately, and

wherein the arrangement, the first and second thicknesses and birefringence properties of the first and second correcting element are selected so that their birefringent effects cancel each other out when the local thickness variations Δd are neglected.